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ABSTRACT

Researchers used cross-sectional survey research to reexamine the problem of adult persistence within undergraduate degree programs. They identified a variable--perceived stress--that permitted a richer explanation of the process of student persistence. A model was presented that examined the attitudinal and behavioral impacts of unmet need, financial aid, financial satisfaction, financial difficulty, and academic performance while maintaining a loosely coupled conceptual kinship to the integrated model of student persistence of Sandler (1999). Empirical considerations of St. John, et al. (1994, 2000) and Sandler were explored to produce an innovative path analysis, thereby investigating nonrecursive and reciprocal interactions that were new to the literature. The hypotheses and effects examined explicated adult student decision-making constraints, attitudes, choices, and behavior allied to the theory of planned behavior of Ajzen that bore an empirical impact and other outcomes within the model. Unmet need was empirically shown to be illustrative of nontraditional students' decision making, having an orthogonal impact, as a direct effect, on financial aid, financial satisfaction, and persistence borne by learners continuing their studies for a degree. Findings indicated perceived stress and cumulative grade point average had the widest range of influence on endogenous variables. (Contains 42 references.) (YLB)

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Perceived Stress and an Elaborated Structural Model of Adult Student Persistence: An Examination of Financial Aid, Financial Satisfaction, Intent to Persist and Persistence

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Perceived Stress and an Elaborated Structural Model of Adult Student Persistence: An Examination of Financial Aid, Financial Satisfaction, Intent to Persist and Persistence

Abstract

With the inclusion of the endogenous variables perceived stress and financial aid to a new theoretical framework, an elaborated model of adult student persistence was identified from paths introduced with the integrated model of student persistence of Sandler (1999, 2000a, 2000b). Of the 25 variables in the nonrecursive path model investigated, the explained variance of twelve endogenous variables is examined with the sociostructural effects of thirteen exogenous variables included. The findings indicate that perceived stress and cumulative GPA have the widest range of influence of the endogenous variables.

As a response to the problem of nontraditional student attrition at two-year and four-year urban colleges, the constructs of perceived stress, financial aid, and financial difficulty are redeployed in an elaborated structural framework that builds upon the theoretical models of Cabrera et al. (1992; 1993). An elemental conceptual allegiance to the student integration model of Tinto (1975; 1987; 1993) and the student attrition model of Bean and Metzner (1985) is charted with new theoretical considerations that remain akin to a recent call by Braxton (2000) to reinvigorate theory and research on the "departure puzzle." An emphasis is given to the incorporation of financial aid, as an endogenous variable (Bean and Metzner, 1985; Bean and Eaton, 2000) with critical attention given in the elaborated framework to sociostructural effects that include: gender, race/ethnicity, relatives/dependents, parents' educational level, household income, and unmet need. Although there has been an awareness of the problem of attrition within undergraduate degree programs, research efforts at examining this trend affecting adult students have been only moderately successful (Kasworm, 1990; Kasworm & Pike, 1994).

The cross-sectional survey research reported in this paper reexamines a neglected dimension that proved to be critical to the understanding of the complexities of adult persistence. It identified a variable, perceived stress, permitting a richer explanation of the process of student persistence (attrition's antonym). The model presented examines the attitudinal and behavioral impact of unmet need, financial aid, financial satisfaction, financial difficulty, and academic performance while maintaining a loosely coupled conceptual kinship to the integrated model of student persistence of Sandler (1999). Empirical considerations of St. John et al. (1994, 2000) and Sandler (2000a, 2000b) are explored to produce an innovative path analysis, thereby investigating nonrecursive and reciprocal interactions that are new to the literature. The hypotheses and effects examined explicate adult student decision-making constraints, attitudes, choices, and behavior allied to the theory of planned behavior of Ajzen (1991) that bear an empirical impact on persistence and other outcomes within the model. Unmet need is empirically shown to be illustrative of nontraditional students decision making having an orthogonal impact, as a direct effect, on financial aid, financial satisfaction, and persistence borne by learners' continuing their studies for a degree.

CONCEPTUAL FRAMEWORK AND RELATED LITERATURE

In light of the findings of Kasworm and Pike (1994) that challenged the appropriateness of the inclusion of academic performance in a traditional model of student satisfaction, careful attention was given, in the development of a new model, to the five perceptual "domains of reality" that Kasworm (1990) revealed in a meta-analysis of research studies that examined nontraditional students. By means of content analysis, five domains of perceptual reality were nominally cited by Kasworm (1990) about past adult undergraduate research: 1) image of

implied deficiency, 2) image of student entry and adaptation, 3) image of description and characterization, 4) image of psychosocial development, and 5) image of equity and outcome. The nominal listing of the five domains gives a brief explanation of the perceptual categories addressed. Readers may refer to Kasworm (1990) for definitional reference regarding each.

Accordingly, the integrated model of student retention of Cabrera et al. (1993) and the integrated model of student persistence of Sandler (1999, 2000a, 2000b) were modified in this research investigation to include new constructs germane to nontraditional students. With the testing of a new structural model, an attempt is made "to capture the reality of the transactional relationship between adult students and the undergraduate institution," by examining adult development in a student learner context (Kasworm, 1990). An emphasis of nontraditional student adjustment (Bean & Metzner, 1985; Chartrand, 1992; Bean & Eaton 2000) to person-environment fit experiences encountered at the institution is examined. In turn, relationships are drawn between the undergraduate experience and other key life roles that adult students endure involving work and family. The constructs, background variables, path relationships, and theories employed bear antecedent reference to the five perceptual domains addressed by Kasworm (1990).

It is in the spirit of revision and new theory generation (Braxton, 2000) that the elaborated hypothetical and empirical models of student persistence introduced here have evolved. New path relationships have been embraced beyond the core of empirically verified relationships that gained acceptance over time with the testing of the study of student departure (Baxton et al., 1997) of Tinto (1975; 1987; 1993). The elaborated model investigated unfolds as a system of twelve variable constructs and their purported relationships while including the effects of thirteen exogenous variables. The testing of the new model presented here attempts to "reinvigorate" (Braxton, 2000) and reexamine the conclusions Kasworm and Pike (1994) make regarding academic performance while accounting, in part, for Braxton et al. (1997) meta-analysis of the theory of student departure of Tinto (1975; 1987; 1993). Empirical considerations of St. John et al. (1994; 2000) regarding finances and price, the related construct of unmet need, and selected paths of the integrated model of student persistence of Sandler (1999; 2000a; 2000b) are examined in an elaborated framework with new evidence.

Perceived Stress

Perceived stress examines the stress experienced by adult students. As a psychological/attitudinal variable, it measures the amount of stress adult students perceive due to the energy they expend and due to the amount of work that college requires (Cabrera, 1988). The stress experienced by adult students may have a positive or negative impact, as the terms "eustress" and "distress" imply respectively (Bean & Metzner, 1985; Munoz, 1987; Selye, 1974; Lazarus &

Folkman, 1984; Bandura, 1997; Dill & Henley, 1998, Bray et al., 1999). The cognitive or attitudinal component of perceived stress was introduced due to evidence of Chartrand (1992) with regard to the mediating effects of the "absence of psychological distress" variable among the constructs of the student attrition model of Bean and Metzner (1985), due to evidence regarding stress-related coping strategies of Bray et al. (1999), and finally due to elements of the integrated model of student persistence of Sandler (1999, 2000a; 2000b). Perceived stress fits within the expanded context of theoretical inquiry explored with this investigation. It couples conceptually with the theory of planned behavior (Ajzen, 1991), the parallel notion of self-efficacy (Bandura, 1997), and the financial attitudes of difficulty and satisfaction as explored with the disbursement of financial aid in this investigation.

The Theory of Planned Behavior--A Conceptual Bridge for Model Integration

The theory of planned behavior acts as a conceptual overlay or bridge for model integration with the elaborated model of student persistence presented here. Pursuing a new exploration of adult adjustment, conceptual variables are theoretically related in a structural model by means of the social cognitive theory of planned behavior (Ajzen, 1991). As an update to the theory of reasoned action of Fishbein and Ajzen (1975), the theory of planned behavior merges the notion of perceived behavioral control with a spectrum of resource considerations that can influence attitude-behavior relations (Bentler & Speckart (1979). "Perceived behavioral control is in turn determined by control beliefs, which are beliefs about the likelihood that one possesses the resources and opportunities thought necessary to execute the behavior or attain the goal" (Eagly & Chaiken, 1993). Relative to Bean and Eaton (2000), elements of the theory of reasoned action and planned behavior act as a conceptual analog to the theory self-efficacy purported by Bandura, (1989; 1997) and are included in the model investigated here as an explanation for attitude-behavior relations in a person-environment or student-learner context (Sandler, 2000b).

Perceived Stress and an Elaborated Model of Adult Student Persistence: A Hypothetical Model

By elaborating the integrated model of student retention of Cabrera et al. (1993) and the integrated model of student persistence of Sandler (1999; 2000a; 2000b) with the endogenous constructs of financial difficulty, financial aid, and perceived stress, an attempt is made to better explain the variance observed of adult students regarding four focal endogenous variables: financial aid, financial attitudes/satisfaction, intent to persist, and persistence. While recognizing the perceived stress experienced by adult students regarding educational development and academic performance, the impact of cumulative GPA and intent to persist on persistence is

assessed in light of the financial attitudes and resources available to them. Through the dynamic interplay of attitude-behavior relations, the elaborated model explains persistence decisions or behavior that may be constrained by limited resources (financial difficulty, financial aid, and family encouragement) not wholly under the volitional control of adult students (Ajzen, 1991) while including for the effects of critical sociostructural or exogenous variables that take account of gender, race/ethnicity, relatives/dependents, parents' educational level, household income, unmet need, academic aspirations, curriculum hours, commuting time, and hours studied/week.

RESEARCH DESIGN AND METHODS

Population and Sample

The population for this research investigation was composed of adult/nontraditional undergraduate students 24 years of age or older studying on a part-time or full-time basis in a two year and four year degree bearing program for adult students. A survey questionnaire was distributed to a randomly selected sample of 937 adult students enrolled during the fall 1995 semester. After a 63 percent survey response and listwise deletion, the sample for data analysis comprised 469 adult students. From these data sources, a total of 25 variables were included in this research study in an effort to ascertain their relationship to persistence. Degree program, one exogenous variable, differentiated between two-year and four-year degree programs and served as a control.

Over ninety five percent of the students in the sample were commuter students. In addition, the sample included students who began their studies at the institution as freshman (41.2%) and transfer students (58.8%). Approximately half the students in the sample were studying for an Associate degree (50.3%), whereas the remaining students were studying for a Bachelor degree (49.7%). Approximately one third of the students were majors in the liberal arts and humanities combined, whereas the remaining students were majors in business, the health professions and the social sciences combined. White students were in the majority (51.0%); non-white students were in the minority by a small margin (49.0%). Female students were predominant (71.2%), whereas male students were smaller in number (28.8%). The persistence rate for the sample population was 79.5% between the fall and spring semesters. Prospective graduates in attendance during the term of investigation were excluded from the sample, so persistence data could be accurately assessed from enrollment records after the survey administration.

Instrumentation

A survey questionnaire, the Adult Student Experiences Survey (ASES) was administered to collect attitudinal data and self-reported background characteristics. The ASES was adapted from the "Student Experiences Survey" of Cabrera (1988) that was employed in "integrated model of student retention" (Cabrera et al., 1993) (instruments used by permission). A reliability analysis is discussed in the following section. As tested, the reliability of scales employed in large part matched or surpassed the levels reported by their respective developers.

Variables in the Study

The predictor endogenous (independent) variables included: financial attitudes/difficulty, family encouragement, financial aid, financial attitudes/satisfaction, academic integration, perceived stress, social integration, institutional commitment, cumulative GPA (Grade Point Average), goal commitment, and intent to persist. The exogenous variables of the model included thirteen variables that pertained to student background: gender, race/ethnic affiliation, relatives/dependents, parents' educational level, household income, hours employed, unmet need, academic degree aspirations, student type, degree program, curriculum hours, commuting time, and hours studied/week. The criterion (a dependent endogenous variable) was persistence, a dichotomous outcome. Definitions of the variable constructs and related information are provided below:

Academic Integration concerns the feelings students' express about being a part of the academic life of the institution. By examining the perceptions of adult students regarding their 1) academic performance, 2) their satisfaction with the curriculum, and 3) their feelings of being a part of the academic institution, the research examined the degree to which students become involved in the academic system and intellectual life of the university (Cabrera et al., 1993). A five category Likert scale, strongly agree to strongly disagree was employed. The Cronbach Alpha reliability coefficient of the three-item scale for academic integration was .57.

Background Variables are data or specific information collected about students prior to their enrollment at the institution. The background data originate from institutional records and by means of the Adult Student Experiences Survey (ASES). The background variables investigated include thirteen exogenous variables: 1) gender, 2) race/ethnic affiliation, 3) relatives/dependents, 4) parents' educational level, 5) household income, 6) hours employed 7) unmet need, 8) academic degree aspirations, 9) student type, 10) degree program, 11) curriculum hours, 12) commuting time, and 13) hours studied/week. Race and gender were included to ascertain the sociostructural impact of these critical background characteristics on the adult learner. Five exogenous variables listed above numbered three, four, five, six, and eight served as controls of the socioeconomic background of the adult population examined. Hours employed,

a self-reported variable, examined the impact that employment had on adult learners. Unmet need concerns students' declared budget of monetary resources minus the cost of tuition and related expenses. Unmet need is an algebraic derivative of price as defined by St. John et al. (1994, 2000). Student type, variable number nine above, controlled for the presence of both freshman students, first time undergraduates at the institution in which the research was conducted, and transfer students. Degree program, variable number ten above, controlled for the presence of adult students studying for two-year and four-year degrees respectively. Curriculum hours, variable number eleven above, served as an institutional measure representing adult students' investment or involvement in their program of study. Commuting time, variable number twelve above, concerned the number of minutes it took a student to travel to a university location from home or work for classes. Hours studied/week examined the amount of time students worked on a program of study per week during the semester.

Cumulative GPA (Grade Point Average) means academic performance as a continuous measure (0.000-4.000). Cumulative GPA was obtained from institutional records to examine the academic performance of adult students.

Family Encouragement was comprised of two items and explores the construct of encouragement from family of Cabrera et al. (1992b; 1993) within the specification of an elaborated model introduced here. A five category Likert scale, strongly agree to strongly disagree was employed. The Cronbach Alpha reliability coefficient of the two-item scale for family encouragement was .84.

Financial Aid was an actual dollar figure dispensed with the awarding of need and non-need based grants and loans.

Financial Attitudes/Difficulty was comprised of two items and involved the "experience of financial difficulty" while at the institution (Cabrera et al., 1992b) and the difficulty in financing a college education (Cabrera, 1988; Mallette & Cabrera, 1991). A five category Likert scale, strongly agree to strongly disagree was employed. The Cronbach Alpha reliability coefficient of the two-item scale for financial attitudes/difficulty was .69.

Financial Attitudes/Satisfaction was comprised of two items that involved the satisfaction with the amount of financial support (grants, loans, family and jobs) received while attending the institution (Cabrera et al., 1992b, Cabrera et al., 1993) and the satisfaction with financial aid programs at the institution as expressed by students (Mallette & Cabrera, 1991). A five category Likert scale, strongly agree to strongly disagree was employed. The Cronbach Alpha reliability coefficient of the two-item scale for financial attitudes/satisfaction was .84.

Goal Commitment was comprised of two items. It concerned the importance students ascribe to a college degree and the "importance of completing program of study" (Pascarella & Terenzini, 1979, 1980; Cabrera et al., 1993). A five category Likert scale, strongly agree to

strongly disagree was employed. The Cronbach Alpha reliability coefficient of the two-item scale for goal commitment was .66.

Institutional Commitment was comprised of four items regarding the student integration model and involved the confidence students have in their institutional choice, and their perceptions of "institutional fit and quality" (Pascarella & Terenzini, 1979, 1980; Cabrera et al., 1993). A five category Likert scale, strongly agree to strongly disagree was employed. The Cronbach Alpha reliability coefficient of the four-item scale for institutional commitment was .78.

Intent to Persist was comprised of four items and involved the likelihood in re-enrolling at the institution as expressed by students (Cabrera et al., 1993). A five category Likert scale, strongly agree to strongly disagree was employed. The Cronbach Alpha reliability coefficient of the four-item scale for intent to persist was .69.

Perceived Stress measures the amount of stress adult students perceive due to the energy they expend and due to the amount of work that college requires. A two-item scale was included that originated with a survey developed by Cabrera (1988). A five category Likert scale, strongly agree to strongly disagree was employed. The Cronbach Alpha reliability coefficient of the two-item scale for perceived stress was .85.

Persistence, the principal variable of this inquiry, is determined by the actual re-enrollment at the institution for the following term of study.

Social Integration was comprised of two items. The scale examined the experience adult students have in making "close personal friendships" and their "ease of meeting and making friends" in college (Cabrera et al., 1993). A five category Likert scale, strongly agree to strongly disagree was employed. The Cronbach Alpha reliability coefficient of the two-item scale for social integration was .73.

Tests for Univariate and Multivariate Normality

Upon prescreening, PRELIS 2.30 revealed a moderate level of kurtosis and skewness among the variables to be investigated. (Joreskog & Sorbom, 1993; Joreskog et al., 1999). An alternative estimator was utilized by employing the weighted least squares (WLS) method to serve as an adjustment for the multivariate non-normal conditions encountered (Bollen, 1989).

Data Analysis Procedures

A two-step data analysis was conducted that included measurement and structural stages. The measurement stage was performed separately with SPSS 9 (SPSS, Inc., 1999). After a reliability analysis was completed on the respective endogenous variable scales, data reduction was performed by means of a principal components procedure on the items of the same variable

scales with SPSS 9 (SPSS, Inc., 1999). The principal components procedure served as a measurement stage for the structural equation path model that followed, after the data was prescreened.

Following data reduction, PRELIS 2.30 produced data transformations among ordinal and continuous variables and provided appropriate covariance matrices that included the asymptotic covariance matrix (Joreskog & Sorbom, 1993; Joreskog et al., 1999). Polychoric, polyserial and product moment correlations were included in the computation of these matrices to enable an advanced estimation of the asymptotic covariance matrix under arbitrary non-normal distributions (Browne, 1982; 1984). The mixture of the aforementioned correlations did not cause problems that pertain to a positive definite matrix. The structural parameter estimation procedures and path analytic protocol of LISREL 8.30 followed using a weighted least squares (WLS) method that adjusted for non-normal conditions when one or more of the observed variables are ordinal (Joreskog & Sorbom, 1993; Joreskog et al., 1999). A hypothetical model is presented in Figure 1.

Insert Figure 1 about here

RESULTS

The total effects among the endogenous variables in the elaborated model of adult student persistence are summarily provided in Figure 2 above an effect size criterion of .10 (Pedhazur, 1996; Stevens, 1996; Hoyle, 1995; Loehlin, 1992; Coher & Cohen, 1983). The trimmed display of the model among the endogenous variables (see Figure 2 below) includes a total of 29 endogenous path relationships. In addition, effects on the endogenous variables of the exogenous variables were included and controlled. The standardized total effect size criterion of .10 suggests that a unit change in the total effect of a given endogenous or exogenous variable is associated with at least a ten percent change (or more) on a given endogenous variable (or dependent outcome) examined.

Insert Figure 2 about here

Goodness of Fit Statistics

As a structural model, "Perceived Stress and an Elaborated Model of Student Persistence" has a "perfect fit," (Chi-square = 151.401 with 219 degrees of freedom; p = 1.000) (Joreskog & Sorbom, 1993). Other indicators of goodness of fit included: Chi-Square/degrees of freedom ratio (.691), goodness of fit index (GFI = .995), adjusted goodness of fit index (AGFI = .993), and the root mean square residual (RMR = .0540). Largest Eigenvalue of B*B' (Stability Index) is .728.

The Squared Multiple Correlation (R^2) for Each Endogenous Variable

The explained variance for each endogenous variable of the elaborated model of student persistence is as follows: financial attitudes/difficulty **(5%)**, family encouragement **(8%)**, financial aid **(23%)**, financial attitudes/satisfaction **(36%)**, academic integration **(31%)**, perceived stress **(26%)**, social integration **(10%)**, institutional commitment **(8%)**, cumulative GPA (Grade Point Average) **(45%)**, goal commitment **(15%)**, intent to persist **(48%)**, and persistence **(42%)**.

The Total Effects Explaining Financial Aid

The explained variance in **financial aid** was moderate at **23 percent**. The two highest ranked total effects on financial aid of the endogenous variables, are listed as follows in descending order of magnitude and are largely direct effects; the indirect effects are very small or marginal in size, whereas the third ranked total effect on financial aid is comprised in its entirety of an indirect effect (see Figure 2): 1) cumulative GPA (total effect = .426, $p < .001$), 2) institutional commitment (total effect = .231, $p < .001$), 3) perceived stress (total effect = .140, $p < .001$).

In addition, the five highest ranked total effects on financial aid of the exogenous variables are listed as follows in descending order of magnitude1) commuting time (total effect = .236, $p < .001$), 2) hours employed (total effect = .228, $p < .001$), 3) gender (total effect = –.222, $p < .001$), 4) race/ethnicity (total effect = –.194, $p < .001$), and 5) unmet need (total effect = .117, $p < .001$). Approximately one third the total effects of commuting time and gender on financial aid are indirect effects, whereas the remaining effects are direct in composition. The total effects of race/ethnicity and unmet need on financial aid are largely direct effects; the indirect effects are very small in magnitude. The total effects on financial aid of hours employed are entirely indirect effects.

The Total Effects Explaining Financial Attitudes/Satisfaction

The explained variance in **financial satisfaction** was moderate at **36 percent**. One sole total effect on financial satisfaction of the endogenous variables was recorded; it is a direct effect in its entirety (see Figure 2): 1) family encouragement (total effect = –.288, $p < .001$). In addition, the six

highest ranked total effects on financial satisfaction of the exogenous variables are listed as follows in descending order of magnitude: 1) commuting time (total effect = .266, $p < .001$), 2) household income (total effect = .191, $p < .001$), 3) academic aspirations (total effect = –.163, $p < .001$), 4) gender (total effect = .149, $p < .001$), 5) degree program (total effect = –.145, $p < .001$), and 6) unmet need (total effect = –.143, $p < .001$). Approximately one fifth of the total effects of commuting time and gender on financial satisfaction are indirect effects; the remaining effects are direct in composition. The total effects of household income and degree program on financial satisfaction are comprised largely of direct effects; the indirect effects are marginal in magnitude. The total effect on financial aid of hours employed is entirely an indirect effect. The total effects of academic aspirations and unmet need are direct effects in their entirety.

The Total Effects Explaining Intent to Persist

The explained variance in **intent to persist** was high at **48 percent**. The four highest ranked total effects on intent to persist of the endogenous variables are listed as follows in descending order of magnitude (see Figure 2): 1) cumulative GPA (total effect = .538, $p < .001$), 2) family encouragement (total effect = .336, $p < .001$), 3) perceived stress (total effect = .177, $p < .001$), and 4) financial aid (total effect = .125, $p < .01$). The total effects on intent to persist of cumulative GPA and family encouragement are largely direct effects; the indirect effects are small and marginal in magnitude respectively. The total effect on intent to persist of perceived stress is entirely indirect, whereas, the total effects on intent to persist of financial aid are direct in their entirety.

In addition, the three highest ranked total effects on intent to persist of the exogenous variables are listed as follows in descending order of magnitude: 1) hours employed (total effect = .331, $p < .001$), 2) relatives/dependents (total effect = –.143, $p < .001$), and 3) curriculum hours (total effect = .141, $p < .001$). The total effect on intent to persist of hours employed is entirely indirect, whereas, the total effects on intent to persist of relatives/dependents and curriculum hours are largely direct effects; the indirect effects are marginal in magnitude.

The Total Effects Explaining Persistence

The explained variance of **persistence** was moderate at **42 percent**. The four highest ranked total effects on persistence of the endogenous variables (see Figure 2): 1) intent to persist (total effect = –. 636, $p < .001$), 2) cumulative GPA (total effect = –.325, $p < .001$), 3) social integration (total effect = .220, $p < .001$), and 4) perceived stress (total effect = –.135, $p < .001$). The total effect on persistence of intent to persist is largely a direct effect; the indirect effect is marginal. The total effects on persistence of cumulative GPA and perceived stress are entirely indirect, whereas, the total effect on persistence of social integration is direct in its entirety.

In addition, the four highest ranked total effects of persistence on the exogenous variables are as follows: 1) gender (total effect. = .214, $p < .001$), 2) hours employed (total effect = – .164, $p < .001$), 3) unmet need (total effect = – .109, $p < .001$), and 4) commuting time (total effect = – .102, $p < .001$). The total effect on persistence of gender and unmet need are largely direct effects; the indirect effects are marginal. In closing, the total effects on persistence of hours employed and commuting time are entirely indirect.

DISCUSSION AND CONCLUSION

Through the dynamic interplay of elements of the theory of planned behavior (Ajzen, 1991), adult student persistence, financial aid, financial satisfaction and intent to persist decisions are comprehensively explained by the elaborated model introduced with this study. In addition, the total effects of unmet need, a condition used in the awarding of financial aid that also served here as an algebraic derivative of price/tuition, were shown to influence financial aid, financial satisfaction, and persistence in an illustrative sociostructural path analysis. The findings obtained corroborate with St. John et al. (1994) and strengthen their argument, whereby the effects of unmet need, available budgetary resources minus tuition and expenses, are shown structurally to have an orthogonal impact as a direct effect on persistence, independent of the effects on financial aid and financial satisfaction among the variables examined.

Although it is difficult to absolutely compare the delta-p statistics from a logistic regression analysis with the standardized total effect coefficients derived in structural equation modeling, these statistics do bear some similarity as coefficients for assessment. The total effect coefficients of unmet on financial aid, financial attitudes/satisfaction, and persistence obtained in this investigation are of an effect size greater than .10, whereas the delta-p statistic obtained by St. John et al. (1994) regarding unmet need and tuition on persistence are marginal in size, perhaps four to eight times smaller than those obtained here bringing the importance of unmet need into new focus with this study, despite differences in the samples and the single versus multiple institution frames of analysis that were employed respectively.

The elaborated model of student persistence discussed here presents nonrecursive path activity and reciprocal path linkages; it explores the notion of triadic reciprocal causation among person, environment and behavior put forward by Bandura (1997; 1986). In short, the model provides an interactionist perspective of social cognitive learning (Bandura, 1997) and the environment that moves beyond the person-environment fit solutions of Tinto (1975; 1987; 1993), Bean and Metzner (1985), and Cabrera et al. (1993) to a path model that is more inclusive and dynamic. It reflects a developmental or temporal transactional exchange among adult students, the environment and the institution.

Nonrecursive interactions or reciprocal relationships between five sets of variables are particularly noteworthy (see Figure 2): financial aid and institutional commitment, academic integration and goal commitment, perceived stress and cumulative GPA, perceived stress and intent to persist, and cumulative GPA and intent to persist. The last three sets of reciprocal linkages are specially worth mentioning because a full circle of bi-directional interaction occurs between them, as depicted in Figure 2 in a triangular manner, regarding perceived stress, cumulative GPA, and intent to persist within a stable system of reciprocal path relations (Bollen, 1989; Joreskog & Sorbom, 1993; Joreskog et al., 1999). This stress, performance, intent to persist cycle of reciprocal activity qualitatively mirrors the behavior that many advisors find familiar in their dealings with non-traditional learners juggling their adult lives.

Discussion About the Findings of Perceived Stress and Cumulative GPA Among the Endogenous Variables

Of the twelve endogenous variables of this study, perceived stress and cumulative GPA have the widest range of influence of the endogenous variables. Perceived stress has significant total effects on seven endogenous variables (financial aid, social integration, institutional commitment, academic performance, goal commitment, intent to persist, and persistence) which corroborates with the findings of Bray et al. (1999) regarding three like variables, but exceeds the span of effects reported by the same researchers by four endogenous variables, above an effect size of .10 within the elaborated model (see Figure 2). In addition, cumulative GPA has significant total effects on six endogenous variables (financial aid, academic integration, perceived stress, institutional commitment, intent to persist, and persistence) above an effect size of .10 within the elaborated model (see Figure 2). The total effects on intent to persist and persistence of perceived stress are entirely indirect, whereas the effects of cumulative GPA on intent to persist are in large part direct and on persistence indirect in their entirety. With respect to the stress and performance subsystem alluded to earlier, the broad span of effects of perceived stress and cumulative GPA in the nonrecursive model introduced here are largely new to the literature and stand in contrast to the conclusions of Kasworm and Pike (1994) regarding the efficacy of the deployment of academic performance in models of student satisfaction/persistence. In particular, as the effects on persistence of academic performance reveal, the issue of the magnitude of the effect is no longer the sole determining problem or issue as Kasworm and Pike (1994) cite. As this study elucidates, the direction of the effect remains critical to a better understanding of adult student departure.

From these findings, clear policy implications arise. The academic and social systems of the adult undergraduate experience must be more attuned to adult students' percepts of academic performance and perceived stress. Students need assistance and co-curricular programming to

help them develop "stress-related coping strategies" (Bray et al., 1999) attuned to performance and the outcomes borne regarding the effects of stress, in particular regarding eustress, where a positive impact has been cited with respect to the effects of stress on financial aid, institutional commitment, academic performance, and intent to persist. Negative consequences regarding the effects of stress, commonly referred to as distress, were in evidence on social integration, goal commitment, and persistence. The findings among the endogenous variables of perceived stress and academic performance suggest that the liberal arts and professional curriculum need to be made relevant regarding the larger environment that affects adult lives by directly linking the curriculum with the world of work and the family (Sandler, 1999; 2000a; 2000b).

Discussion About the Effects Explaining Financial Aid and Financial Satisfaction

With the additions of financial difficulty, perceived stress, unmet need, and all the effects included in the structural equation, the explained variance of financial aid (23 percent) was evaluated at a moderate level. It exceeded the level of explained variance of financial aid examined in a model of finances and persistence ("8 percent") of Cabrera et al. (1992). Total effects included the following: academic integration, institutional commitment, intent to persist, gender, race/ethnicity, hours employed, unmet need, and commuting time. Women, minority students, students with greater unmet need, and students with longer commuting time express a greater need of financial aid.

In addition, the explained variance of the structural equation for financial satisfaction (36 percent) was evaluated at a moderate level. Total effects included the following: family encouragement, gender, household income, unmet need, academic aspirations, degree program, and commuting time. Unlike the effects of gender on financial aid, male students, students with higher incomes, students with lower levels of unmet need, and students with longer commuting time express greater financial satisfaction with the institution.

Discussion About the Effects Explaining Intent to Persist and Persistence

With the additions of financial difficulty, unmet need, and all the effects included in the structural equation, the explained variance of intent to persist (48 percent) was evaluated at a moderate to high level. It surpassed the level of explained variance of intent to persist examined in the integrated model of retention ("43 percent") of Cabrera et al. (1993), that was tested with a traditional population of students, by a small margin, but fell short of the explained variance of the integrated model of student persistence of Sandler (2000b) at "(65 percent.)" Total effects included the following: cumulative GPA, family encouragement, perceived stress, financial aid, hours employed, relatives/dependents, and curriculum hours. Adults with higher levels of perceived stress express higher levels of intent to persist. Students with greater hours of

employment, smaller families (relatives/dependents), and higher curriculum hours have stronger attitudes about persistence (intent to persist).

In addition, the explained variance of the structural equation for persistence was at a moderate level (42 percent). It was similar to the level of explained variance of persistence examined in the integrated model of retention ("47 percent") of Cabrera et al. (1993) and of the integrated model of student persistence of Sandler (2000b) at "(43 percent)." Total effects included the following: perceived stress, social integration, cumulative GPA, intent to persist, gender, hours employed, unmet need, and commuting time. Adults with lower levels of perceived stress exhibit higher levels of persistence. Male students, students with lower hours of employment, lower unmet need, and shorter commuting time exhibit a stronger capacity for persistence.

General Conclusions

Trends in enrollment management concerning the impact of financial aid on access and persistence that became prevalent in the 1990s (Baker and Velez, 1996) are assessed from the evidence presented. The managerial or institutional practice of merit appraisal linked with higher levels of academic performance is explicated in the elaborated model with the awarding and consumption of financial aid. From other evidence of a multi-institutional and national origin, Heller (2000) speculated about similar patterns regarding enrollment management practices in the 1990s. As the path analysis in this study reveals, outcomes related to this financial aid practice indicate that student attitudes about persistence (intent to persist) and academic performance behavior counter-intuitively bear a negative or inverse impact, in a causal manner, on persistence, contrasting with the conclusions of some researchers regarding the sustained effect of access and opportunity on within year persistence (Adelman, 1999; Baker & Velez, 1996; Whitaker & Pascarella, 1994).

As the evidence of this study suggests, and as elements of the theory of planned behavior of Ajzen (1991) and the elaborated model illustrate, adult student retention practices may be sustaining educational promise, in spite of the negative effects of student attitudes about re-enrollment on persistence and the negative effects on persistence of academic performance. Students' attitudes, choice to borrow (financial aid), and behavior to persist may become sustained, and in part ensnared, in a system of adult undergraduate education propelled by the multiple realities, illusions, and opportunities of academic enterprise in the name of financial aid (student loans). Unfortunately, as this model illustrates, the hyperbole about access (Adelman, 1999; Baker and Velez; 1996), lifelong learning and adult undergraduate education may become checked by negative outcomes that pertain to the effects of intent to persist and academic performance on persistence between terms.

Nevertheless, with regard to within year student persistence outcomes, this study shows that financial aid and enrollment management practices of the 1990s may have had sustaining value despite the inverse effects of academic performance and intent to persist on persistence. Indeed as this study explicates, a new diverse population of nontraditional students that have gained access to higher education over the past decade have affirmed that social integration has a positive effect on persistence due to the sense of social belonging (Hurtado & Carter, 1997) (social integration) that these adult students have asserted in persisting, and the perceived opportunity (perceived behavioral control and the theory of planned behavior) that these enrollment management practices have borne.

Although this study does not operationalize the notions of debt-load and loan-default, debt and default may not be far from the path analysis explicated in this study (Cofer & Somers, 1999). As an unfortunate sequalae to persistence/attrition decision-making process explicated with this study, negative consequence can arise with debt-load and loan default for many students. This research attempts to reinvigorate the "departure puzzle" with new theoretical considerations (Baxton, 2000) in an elaborated framework, and perhaps for the first time, it illustrates that adult students may well be aware of the inverse effects that their intentions and academic performance have on persistence, while confronting the question of continuing their education or not between terms in a given academic year. In light of these findings increased legislative initiative on need-based financial aid and grants requires more active consideration due to an animated tax cut climate that has imbued the nation's politics.

References

Adelman, C. (1999). Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment. Washington, D.C. U.S. Department of Education, Office of Educational Research and Improvement.

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50, 179-211.

Baker, T. L., & Velez, W. (1996). Access to and opportunity in postsecondary education in the United States--A review. Sociology of Education, NSI, 82-101.

Bandura, A. (1986). Social Foundations of Thought and Action: A Social Cognitive Theory. Englewood Cliffs, N.J.: Prentice Hall.

Bandura, A. (1997) Self-Efficacy: The Exercise of Control. New York: W. H. Freeman and Company.

Bean, J. P. and Eaton, S. B. (2000). A Psychological Model of College Student Retention, in J.M. Braxton (Ed.) Reworking the Student Departure Puzzle. Nashville: Vanderbilt University Press.

Bean, J. P. and Metzner, B. S., (1985) A conceptual model of nontraditional undergraduate student attrition. Review of Educational Research, 55 (4), 485-540.

Bollen, K. A. (1989). Structural equations with latent variables. New York: Wiley.

Braxton, J. M. (2000). Reinvigorating Theory and Research on the Departure Puzzle, in J.M. Braxton (Ed.) Reworking the Student Departure Puzzle. Nashville: Vanderbilt University Press.

Braxton, J. M., Shaw Sullivan, A. V. and Johnson, Jr., R. M. (1997). "Appraising Tinto's theory of college student departure," in Higher education: Handbook of theory and research, Volume XII, edited by Smart, J. C., New York: Agathon Press.

Bray, N. J., Braxton, J. M., and Sullivan, A. S. (1999). The influence of stress-related strategies on college student departure decisions. Journal of College Student Development, (40) (6), 193-202.

Cabrera, A. F. (1988). Student Experiences Survey. University of Houston: Houston TX.

Cabrera, A., Nora, A., and Castaneda, M. B. (1992). Role of finances in the persistence process - a structural model. Research in Higher Education, 33 (5), 571-593.

Cabrera, A. F., Nora, A., and Castaneda, M. B. (1993). College persistence: Structural equations modeling test of an integrated model of student retention. Journal of Higher Education, 64 (N2), 123-139.

Chartrand, J. M. (1992). An empirical test of a model of nontraditional student adjustment. Journal of Counseling Psychology, (39) (2), 193-202.

Cofer, J. and Somers P. (1999). Deeper in Debt: The Impact of the 1992 Reauthorization on Student Persistence. Paper presented to the annual forum of the Association for Institutional Research.

Cohen J., & Cohen P. (1983). Applied Multiple Regression/Correlational Analysis for the Behavioral Sciences. Hillsdale, N.J.: Lawrence ErlBaum Associates, Publishers.

Dill, D. I. & Henley T. B. (1998). Stressors of college: A comparison of traditional and nontraditional students. The Journal of Psychology, (132), (1), 25-32.

Fishbein, M., & Ajzen, I. (1975). Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research. Reading, MA: Addison-Wesley.

Hoyle, R. H. (1995). "The Structural Equation Modeling Approach: Basic Concepts and Fundamental Issues" in R. H. Hoyle (Ed.) Structural Equation Modeling: Concepts, Issues and Applications. Thousand Oaks, CA.: Sage Publications.

Hurtado, S., and Carter, D. F.(1997). Effects of college transition and perceptions of the campus racial climate on Latino college students' sense of belonging. Sociology of Education, (70), 324-345.

Joreskog, K. G., and Sorbom, D. (1993). LISREL 8. Mooresville, IN: Scientific Software, Inc.

Joreskog, K. G., Sorbom, D., du Toit, S, and du Toit, M (1999). LISREL 8: New Statistical Features. Scientific Software International, Inc.

Kasworm, C. E. (1990). Adult undergraduates in higher education – A review of past research perspectives. Review of Educational Research, 60, (3), p. 345-372.

Kasworm, C. E. and Pike, G. R. (1994). Adult undergraduate students – evaluating the appropriateness of a traditional model of academic performance. Research in Higher Education, 35, (6), p. 689-710.

Lazarus, R. S., & Folkman, S. (1984). Stress, Appraisal, and Coping. New York: Springer.

Loehlin, J. C. (1992). Latent Variable Models: An Introduction to Factor, Path, and Structural Analysis. Hillsdale, N.J.: Lawrence Erlbaum Associates, Publishers.

Monteverde, K. (2000). Managing Student Loan Default Risk: Evidence from a Privately Guaranteed Portfolio. Research in Higher Education, 41, (3), p. 331-352.

Munoz, D.G. (1987). Identifying areas for stress for Chicano undergraduates. In M. A. Olivas (Ed.), Latino College Students. p. 131-156. New York: Columbia University Press.

Pedhazur, E.J. (1996). Multiple Regression in Behavioral Research: Explanation and Prediction. Fort Worth T X.: Harcourt Brace College Publishers.

Sandler, M. E. (1999). A Structural Model of Student Integration, Finances, Behavior, and Career Development: An Elaborated Framework of Attitudes and Persistence. Paper presented to the annual meeting of the Association for the Study of Higher Education, San Antonio, TX.

Sandler, M. E. (2000a). A Focal Examination of Integration, Commitment, and Academic Performance: Three Subsystems from the Integrated Model of Student Persistence with Sociostructural Background Variable Effects. Paper presented to the annual meeting of the American Educational Research Association, New Orleans, LA.

Sandler, M. E. (2000b). Career Decision-Making Self-Efficacy, Perceived Stress, and an Integrated Model Of student Persistence: A Structural Model of Finances, Attitudes, Behavior, and Career Development. Research in Higher Education, 41, (5), p. 537-580.

Selye, H. (1974). Stress without distress. New York: Lippincott.

SPSS, Inc. (1999). SPSS Base 9.0 User's Guide/SPSS. Chicago, IL: SPSS, Inc.

St. John, E. P., Cabrera, A. F., Nora, A. and Asker, E. H. (2000). Economic Influences on Persistence Reconsidered: How Can Finance Research Inform the Reconceptualization of Persistence Models, in J.M. Braxton (Ed.). Reworking the Student Departure Puzzle. Nashville: Vanderbilt University Press.

St. John, E. P., Andrieu, S. C., Oescher, J. and Starkey, J. B. (1994). The influences of price and subsidies on within-year persistence by traditional college-age students in four year-year colleges. . Research in Higher Education, 35, (4), p. 455-480.

Stevens, J. (1996). Applied Multivariate Statistics for the Social Sciences. Mahwah, N.J.: Lawrence Erlbaum Associates.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. Review of Educational Research, 45, 89-125.

Tinto, V. (1987). Leaving College: Rethinking the Causes and Cures of Student Attrition. Chicago: University of Chicago Press.

Tinto, V. (1993). Leaving College: Rethinking the Causes and Cures of Student Attrition. 2nd Edition. Chicago: University of Chicago Press.

Whitaker, D. G., & Pascarella, E. T. (1994). Two-year college attendance and socioeconomic attainment: Some additional evidence. Journal of Higher Education, 65(2), 194-210.

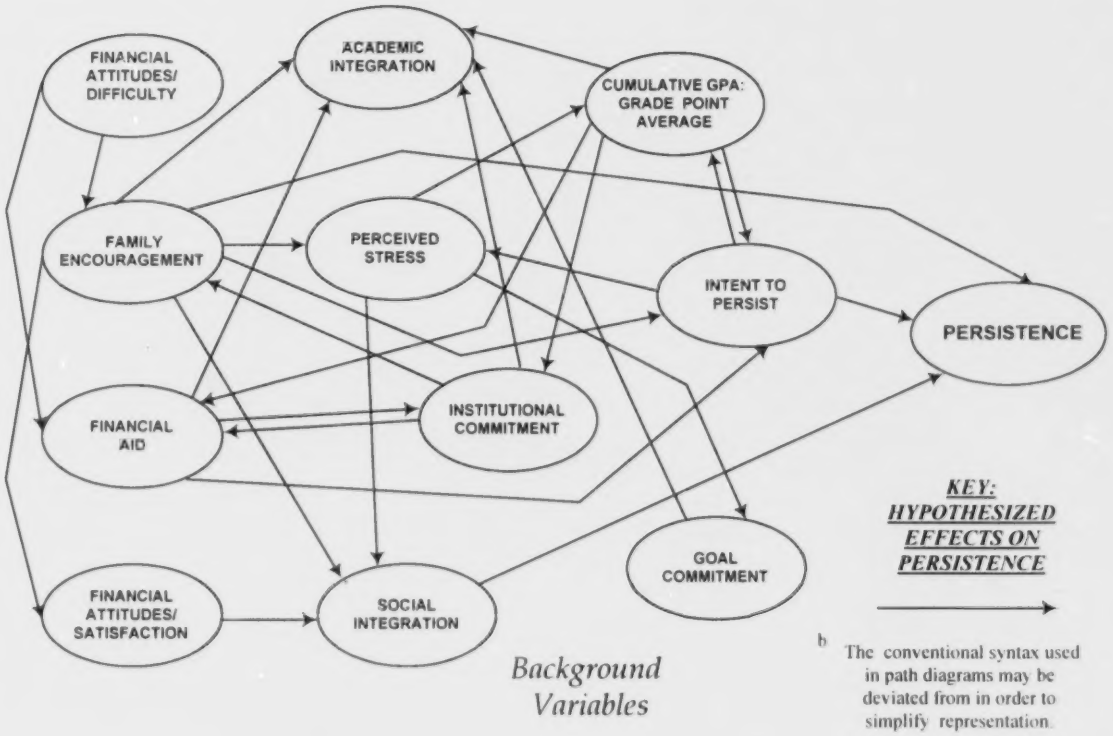
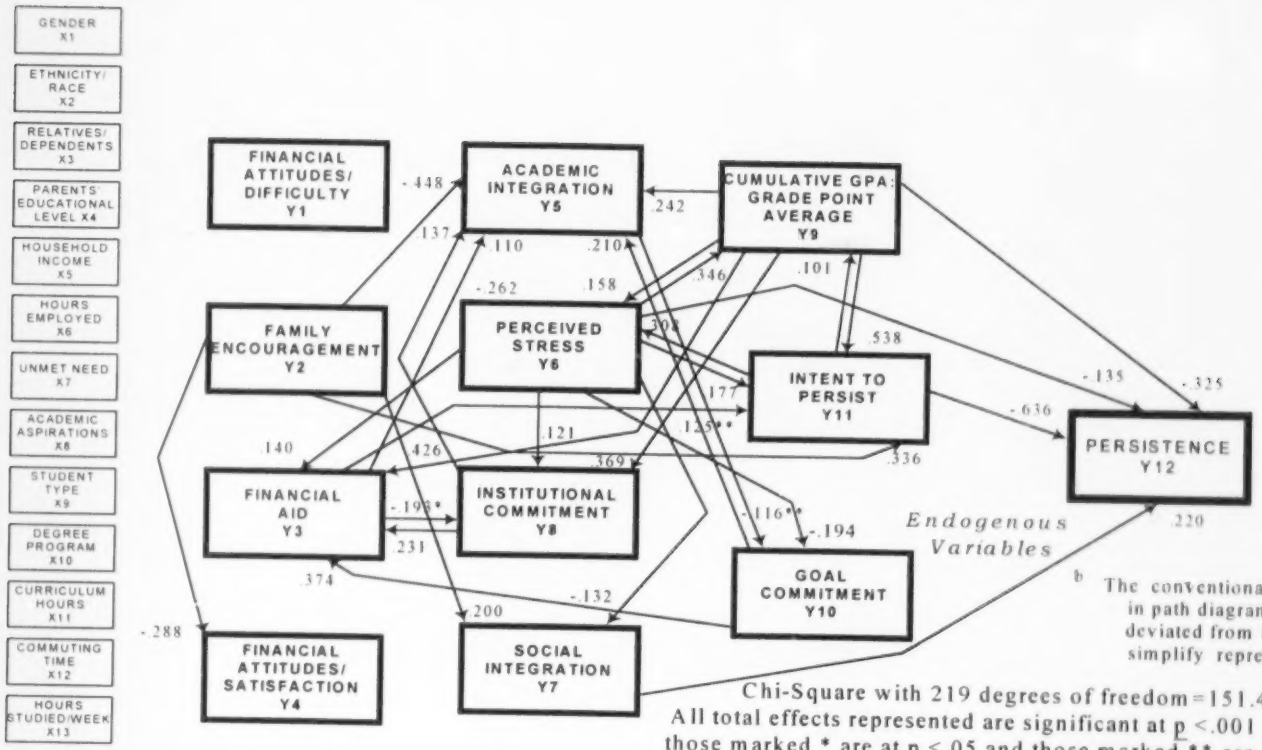


Figure 1: Perceived Stress and an Elaborated Model of Student Persistence: A Hypothetical Model [b]



[b] The conventional syntax used in path diagrams may be deviated from in order to simplify representation.

Chi-Square with 219 degrees of freedom = 151.401 (p = 1.000). All total effects represented are significant at $p < .001$ with the exception of those marked * are at $p < .05$ and those marked ** are at $p < .01$; total effects <.100 are trimmed and not represented. The figure presented serves as a final structural model.

Figure 2: Perceived Stress and an Elaborated Model of Student Persistence: Total Effects Among the Endogenous Variables Within a Trimmed Display of the Model [b]